Federal Democratic Republic of Ethiopia

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ET 695 (2002) (English): PESTICIDES: PACKAGING

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ETHIOPIAN
STANDARD

ES 695:2002

(Reaffirmed: 2012)

First edition

Pesticides Packaging

ICS: 65.100.01

Published by Ethiopian Standards Agency

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Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Pesticides (TC 19) and published by the Ethiopian Standards Agency (ESA).

The standard is a reaffirmation for reprint of the Ethiopian Standard ES 695:2002 Pesticides -Packaging , with some editorial changes without altering the technical contents in the former text.

Pesticides — Packaging

1 Scope

1.1 This Ethiopian Standard specifies the general requirements for the packaging of pesticides.

1.2 This Ethiopian Standard does not cover the packaging requirements of pesticides used for household.

2 Normative references

The following Ethiopian Standards contain provisions, which, through reference in this text, constitute the provisions of this Ethiopian Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Ethiopian Standard are encouraged to investigate the possibility of applying the most recent editions of the Ethiopian Standards indicated below. Registers of currently valid standards are maintained in the Ethiopian standrads Agency .

ES 693, *Pesticides - Terminology*.

ES OIML R 87, Net content in packages.

3 Definitions

For the purpose of this Ethiopian Standard, the following definitions and terms defined in ES 693 shall apply.

3.1
consumer pack
pesticides packed in single or individual containers of up to 5 kg net weight for solids, and not greater than 5 litres net content for liquids

3.2
over packs
the outer container enclosing and protecting one or more consumer packs

3.3
bulk pack
pesticides packed in single or individual containers having a net content of greater than 5 kg for solids or 5 litres for liquids

3.4
damage
a structural weakening of the inner container(s) as well as the outer pack, which has, or could lead to leakage of the containers.

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4 General packaging requirements

4.1 Pesticides, technical and their formulations shall be packed in a suitable, clean and dry containers which do not affect, and are not affected by the product they contain in the sizes given in Table 1 and Table 2.

Table 1 — Pack size for solid pesticides

Range of sizes	pack sizes
50 gm up to 1 kg	50 g, 100 g, 250 g, 500 g, 1 kg
Above 1 kg up to 5 kg	2.5 kg, 5 kg
Above 5 kg up to 25 kg	10 kg, 25 kg
Above 25 kg up to 200 kg	50 kg, 100 kg, 200 kg

Table 2 — Pack sizes for liquid pesticides

Range of sizes	pack sizes
100 ml up to 1 l	100 ml, 250 ml, 500 ml , 1l
Above 1 l up to 10 l	5 l, 10 l
Above 10 l up to 200 l	25 l, 50 l, 100 l and 200 l

4.2 The completed container for the product, shall be of sufficient strength and shall provide all necessary portection against compaction, atmospheric moisture, oxidation, loss by evaporation and contamination, to ensure that the product suffers no deterioration under normal conditions of transit and storage.

4.3 Where necessary, containers shall be lined with suitable material to prevent corrosion or deterioration of the contents or container, inclduing container-closures.

4.4 Outer surfaces of container shall be so constructed or treated, as to prevent corrosion or deterioration of the container and/or the label.

4.5 The pesticide container shall be sufficiently stable to withstand the rigours of handling, loading, stacking and unloading, as encountered in normal storage and transportation conditions, and the product contained therein, should be able to meet all product-specifications for a minimum period of two years, or the period of the shelf life of the product, whichever is the shorter. For products of shorter shelf lifes, the maximum period of stability should be stated on the lable of the package.

4.6 Closures, wherever provided, shall be leak proof and tamper proof. The stitching thread of the bags shall be sealed with the metal seal at both ends or the tamper proofness shall be secured by any other suitable means.

4.7 The packing shall also conform to the tariff rules in force from time to time for the packing of goods falling in the catagory of materials of low flash point, dangerous and toxic, wherever applicable.

4.8 In addition to the above requirements, the pesticides package shall comply as appropriate, with the requirements given in ES OIML R 87.

4.9 Unless otherwise agreed to between the purchaser and the supplier, retail packages shall be further packed in corrugated fibreboard boxes or wooden cases when they require transportation.

5 Specific requirements

5.1 Consumer packs

5.1.1 Solid pesticides

5.1.1.1 Solid pesticides for consumer packs of not greater than 500 g net weight, shall be packed in polyethene containers having a film thickness of not less than 250 gauge, or in any other packaging material equivalent strength.

Solid pesticides for consumer of greater than 500 g net weight, shall be packed in mild steel, and shall have an inner-liner of polythene, aluminum foil or equivalent material. The inner-liners shall be carefully sealed after the drums are filled.

NOTE: Due to the variation in the nature and size of the container, their destination and other factors, it is not possible to specify the thickness of the polythene to be used. However, as a guide line, the inner liner for a container with 50 kg of product shall be at least 0.075 mm thick.

5.1.1.2 Heat-sealing of the containers and machine stitching of the bags shall be such that no material comes out from the seams /seals/ during normal handling.

5.1.1.3 For the individual pack of 5 kg and above in case of encapsulated granules hand gloves shall be provided.

5.1.2 Liquid pesticides

5.1.2.1 Liquid pesticides shall be packed in mild steel containers and cans. Rigid wall plastic containers (HDPE) may be used under certain circumstances, provided that they adequately satisfy the general packing requirements as specified in clause 4.

5.1.2.2 Special attention should be made with regard to fittings and gaskets, as well as seams. These shall be made of inert material (material that is not affected by and which does not react to the pesticide). When ever metal cans are used, these shall be properly lined with inert materials to prevent corrosion of the packing material by the pesticide.

5.1.2.3 Containers holding 5 litres or more of liquid pesticides shall be provided with a suitable pouring device with each container.

5.1.3 Fumigants

5.1.3.1 Fumigants, which develop pressure at ambient temperatures, shall be packed in special designed pressure-resistant containers.

5.1.3.2 Containers shall have an adequate wall-gauge and sealed in a manner that precludes leakage or explosion at ambient temperatures.

5.1.3.3 Valves used, shall be designed such that they offer directional release of the fumigant but should preclude accidental release of the fumigant.

5.2 Overpacks

5.2.1 One or more consumer packs shall be packed as over packs, in boxes or cartons of sufficient rigidity to prevent compaction, and damage to the contents. Adequate internal packing material shall be used as necessary, to protect the consumer packs from damage.

5.2.2 The grammage of the board material used in cartons shall not be less than 190 g/m^2, as tested in accordance with the method outlined in annex A.

5.2.3 The boxes of cartons so packed, when dropped 10 times on to a concrete floor, from a height of 1.2 m, on the base, long base edge, short base edge and the included corner, shall not be damaged.

5.3 Bulk packs

5.3.1 Bulk packs shall be rigid-wall packs, consisting of one of the following:

5.3.1.1 Reinforced multi-ply fiber or corrugated-paper boxes corrugated fiber board boxes, with polythene inner-liners of not less than 0.5 mm thickness, and adequately sealed.

5.3.1.2 Fiber board drums, complying with the following requirements:

a) Fiberboard drums shall have an inner liner of not less than 0.5 mm thickness and shall be sealed.

b) The drum shall, according to their capacity comply with the minimum requirements for burst-strength, and minimum thickness of end-wall given in annex B.

5.3.1.3 Metal drums

5.3.1.3.1 Metal drums shall have an inner-lining (or coating) of plythene or epoxyphenolic lacquer (or any other equivalent lining).

5.3.1.3.2 Lids or screw-cap openings shall have adequate gaskets or washers. In addition, metal drums shall comply with the following requirements:

a) Air pressure test requirement

When subjected to an internal air pressure of:

(I) 0.4 kg/cm^2, minimum, and when immersed in water for at least 15s, for drums of less than 200 litres capacity, or;

(ii) 0.5 kg/cm^2, minimum, and when immersed in water for at least 30s, for drums of 200 litre capacity and over, the drum shall show no sign of leakage;

b) Vertical impact test by dropping

When subjected to the test outline in annex C, the drums shall show no sign of leakage.

c) Hydraulic pressure test

When subjected to an applied constant hydraulic pressure of 2.8 kg/cm^2 for a period of not less than 5 min, the drums shall not show any sign of leakage.

5.3.2 Where solid pesticides are packed in bulk packs, the packaging shall comply with clauses 5.3.1.1, 5.3.1.2 or 5.3.1.3 as appropriate.

5.3.3 Where liquid pesticides are packed in bulk packs, these shall comply with clause 5.3.1.3

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Annex A

(Normative)

Substance weight of packing material

A.1 General

A specimen or a test piece cut to a suitably size of not less than 25 cm × 25 cm is weighed and the weight is calculated. Weight is expressed as substance weight.

A.2 Apparatus

A.2.1 A balance sensitive to 0.25% of the load applied and so graduated that readings of this degree of accuracy may be made.

A.2.2 A suitably calibrated sheet - weighing balance designed to indicate the weight of the ream directly when only one sheet of the paper of the given size is weighed on it, may be used.

A.3 Procedure

Use a specimen or cut a test piece in the form of a rectangle to any convenient size of not less than 25 cm × 25 cm, Measure the side correct to 0.5% for each dimension. Determine the area of the specimen/test piece correct to the nearest 0.25% of the area. Weigh the specimen/test piece correct to 3 significant figures.

A.4 Calculation

$$\text{Substance weight in g/m}^2 = \frac{10{,}000w}{ab}$$

Where:

w is the weight in g of the specimen/test piece weighed;

a is the length in cm of the specimen/test piece weighted; and

b is the width in cm of the specimen/test piece weighed

A.5 Report

Weigh one test piece from each sample sheet separately and report the average, maximum and minimum values of the result

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Annex B

(Normative)

Minimum burst - strength for fiberboard drums

B.1 The following are the minimum burst - strengths, according to the weight of contents, of fibreboard drums:

Table 1 - Brust - strengths for fibreboard drums

Weight of content in Kg	Sidewall calculated minimum burst strength in kgf/cm^2	Fiberboard minimum burst strength in kf f/cm^2	Mild steel minimum thickness in mm	Ply wood minimum thickness in mm
6	16	16	0.4	4
13	16	16	0.4	4
25	16	21	0.4	4
38	21	21	0.5	4
50	23	25	0.5	4
75	23	28	0.5	4
100	39	46	0.5	6
150	53	53	0.6	6
200	63	63	0.6	8
250	70	77	0.6	8

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Annex C

(Normative)

Vertical impact test by dropping

C.1 Drums shall, according to their capacity, be tested according to the procedure outlined in C.1.1 or C.1.2.

C.1.1 Test **procedure for drums of less than 200 liters capacity**

C.1.1.1 Fill a drum to 98% of its total capacity with water, close drum properly. Keep its diagonal in a vertical position and drop it 4 times form a height of 1 meter on a concrete in such a manner that the following points of the drums strike the floor on each drop in turn:

a) the bottom rim near its junction with the side seam;

b) the top rim near its junction with the side seam;

c) the bottom rim diametrically opposite the position at (a); and

d) the top rim diametrically opposite the position at (b).

C.1.1.2 Empty the drum after the conclusion of the 4 drops, immerse it in water and subject it to an internal air pressure of 0.40kg/cm^2, minimum, for at least 15 seconds. The drum shall not show any sign of leakage.

C.1.2 Test **procedure for drums of 200 liters capacity or greater**

Fill the drum to 98% of its gross capacity with water and close the drum properly. Suspend the drum with the diagonal in a vertical position. Drop the drum twice vertically from a height of 1.25 m on to a concrete floor in such a way that the following points of the drum strike the floor on each drop in turn:

a) the top rim at its junction with the side seam; and

b) the bottom rim at its junction with the side seam

C.1.2.2 Empty the drum after the conclusion of the two drops, immerse it in water and subject it to an internal pressure of 1.0 to 1.2 kg/cm^2. The drum shall not show any sign of leakage.

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Ethiopian Standards Agency

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010.ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1970.

ESA's objectives are:-

- ❖ Develop Ethiopian standards and establish a system that enable to check weather goods and services are in compliance with the required standards,
- ❖ Facilitate the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational Institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/ or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes. Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

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International Involvement

ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM).It is a founding member of the African Regional Organization for standardization (ARSO).

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